



MAPPING VULNERABILITY

Social and Environmental Liveability in Kathmandu

2000 YEARS OF CONTINUOUS SETTLEMENT GIVES THE CITY ITS BEAUTY AND CULTURE



AT THE SAME TIME, IT ALSO GIVES IT SIGNIFICANT PROBLEMS



Flooding



Haphazard Urbanisation

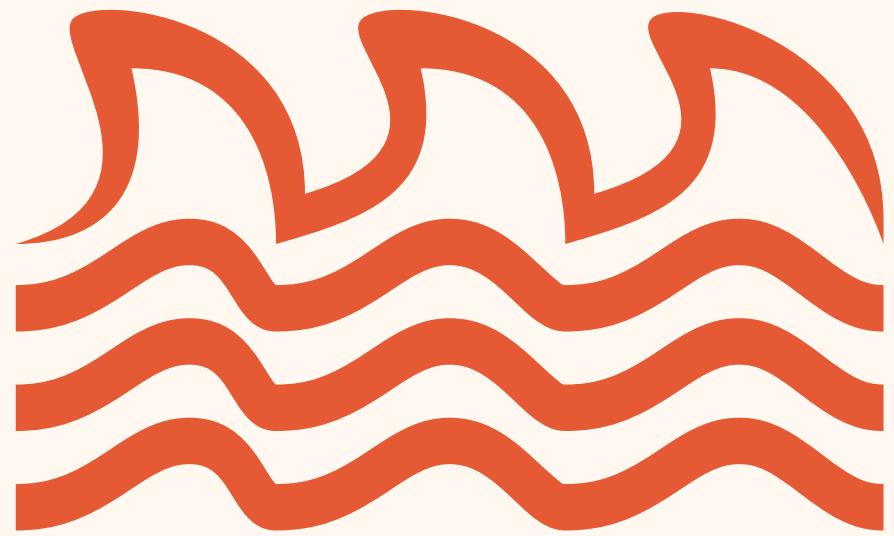
AT THE SAME TIME, IT ALSO GIVES IT SIGNIFICANT PROBLEMS



Conversion of Agricultural Hill
Lands into Housing

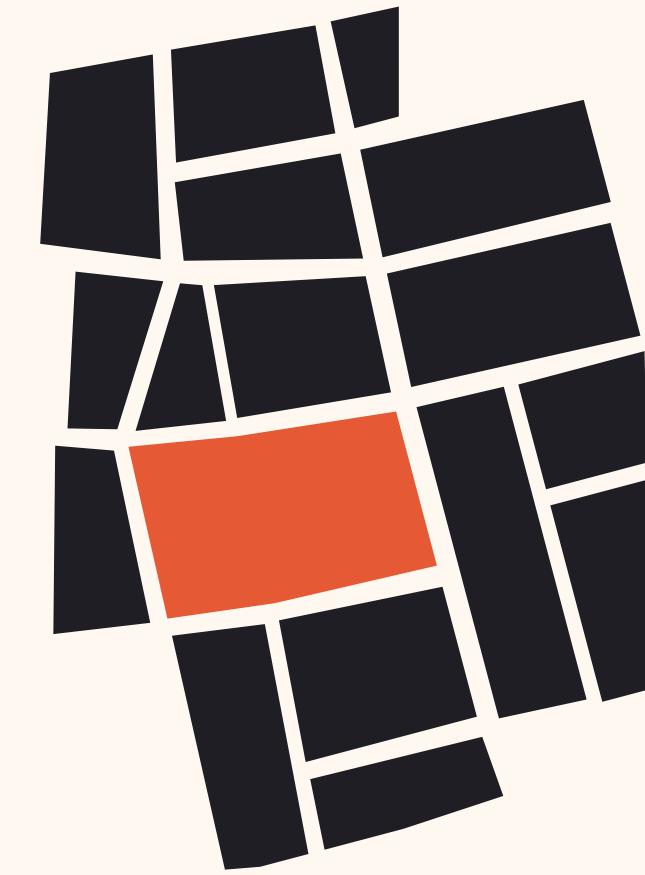
How do these overlapping vulnerabilities map out spatially across the city?

CREATING A VULNERABILITY MAP



Flooding

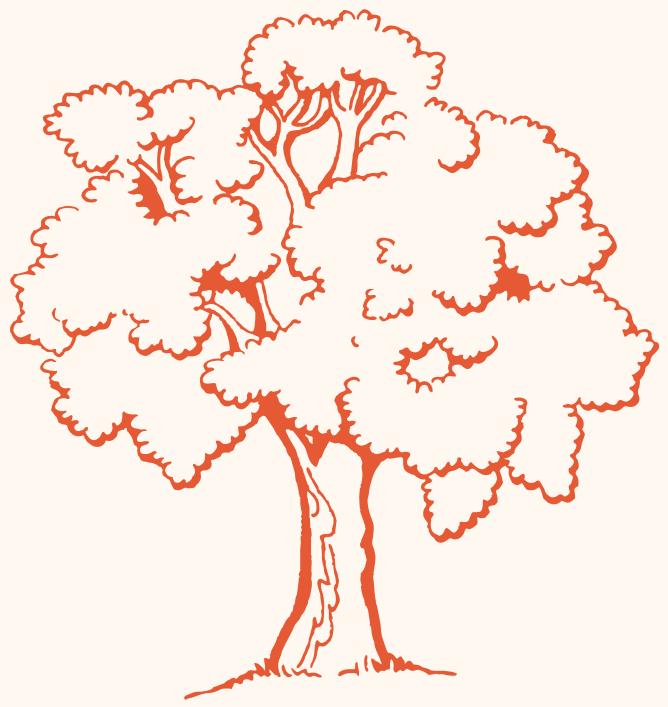
Download NASA DEM Data
Upscale Resolution
Predict Innundation



Built Up Area

Download OSM Polygons
Training on 2024 Landsat
Binary Classification With
Random Forest on Landsat Imagery
to Predict 2025 Built Area

CREATING A VULNERABILITY MAP



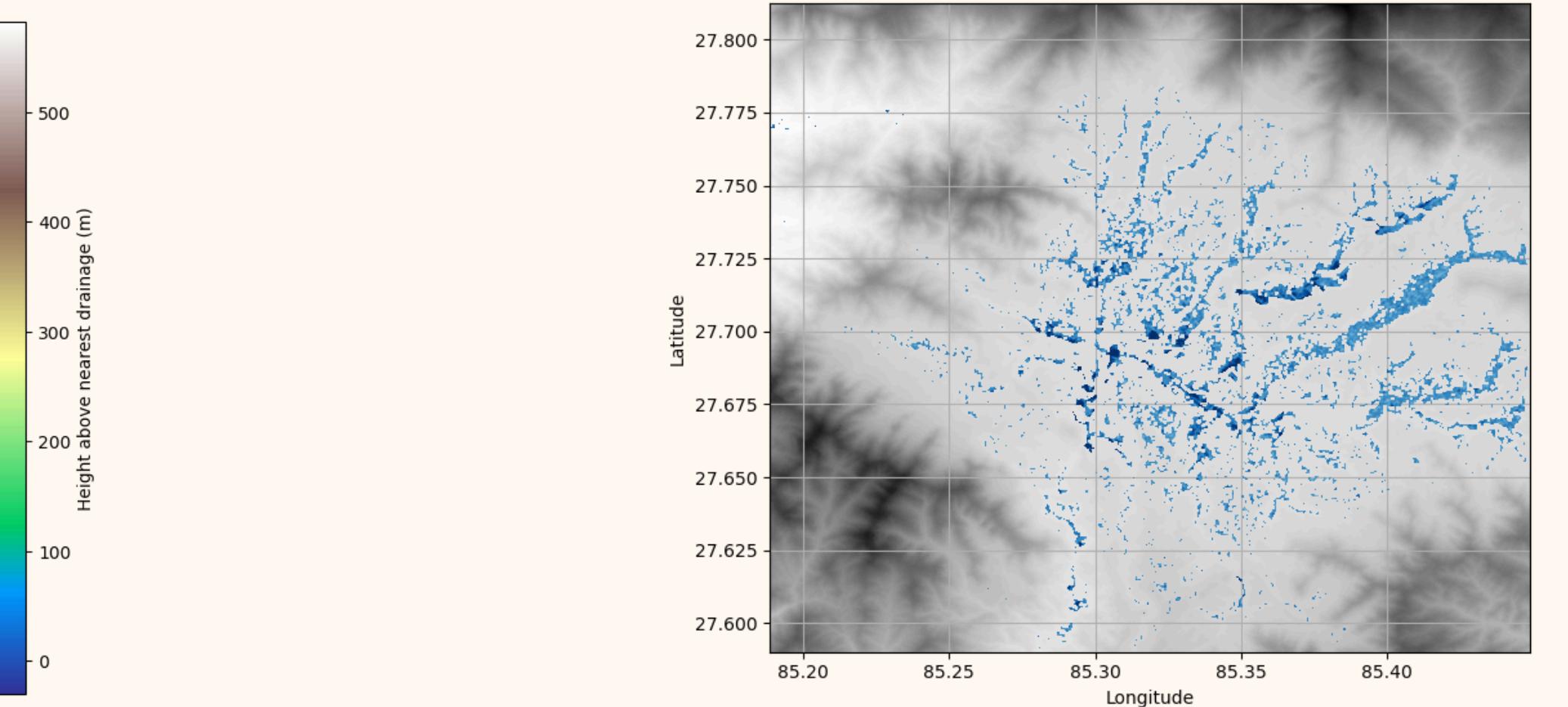
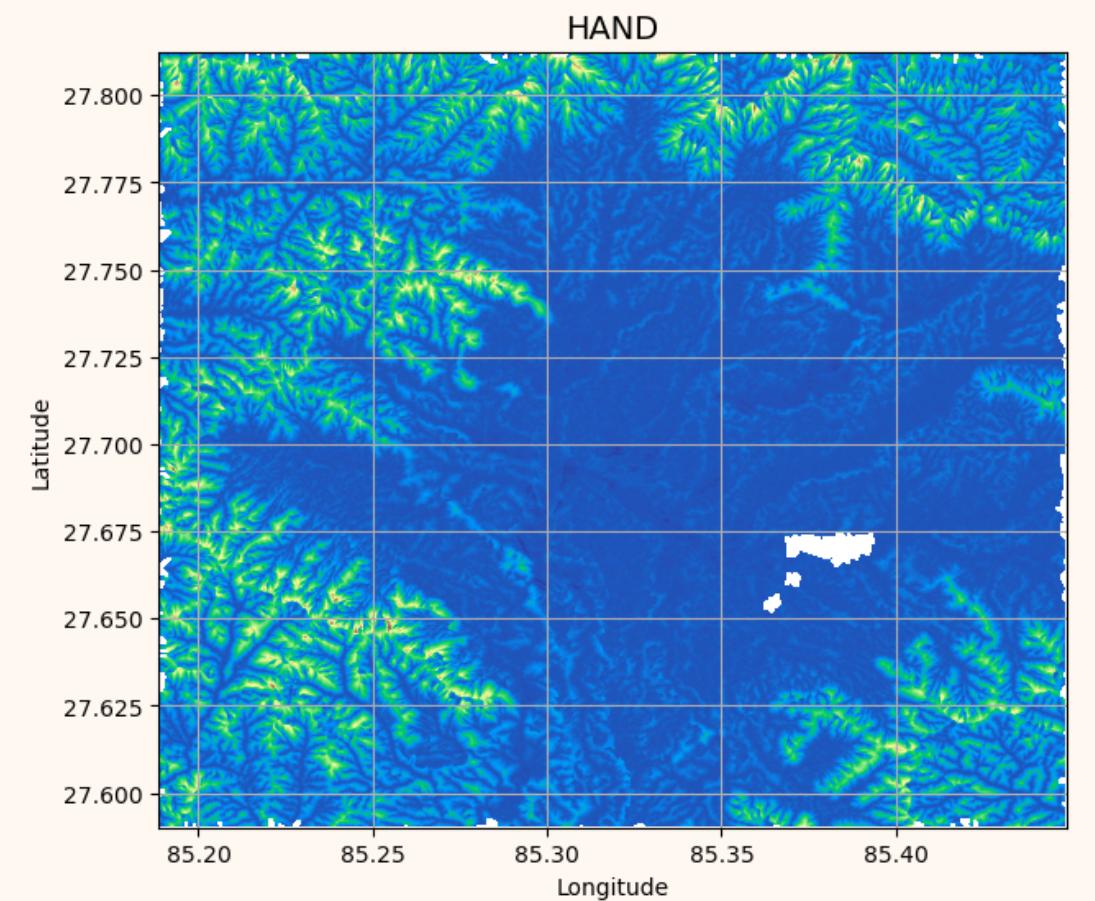
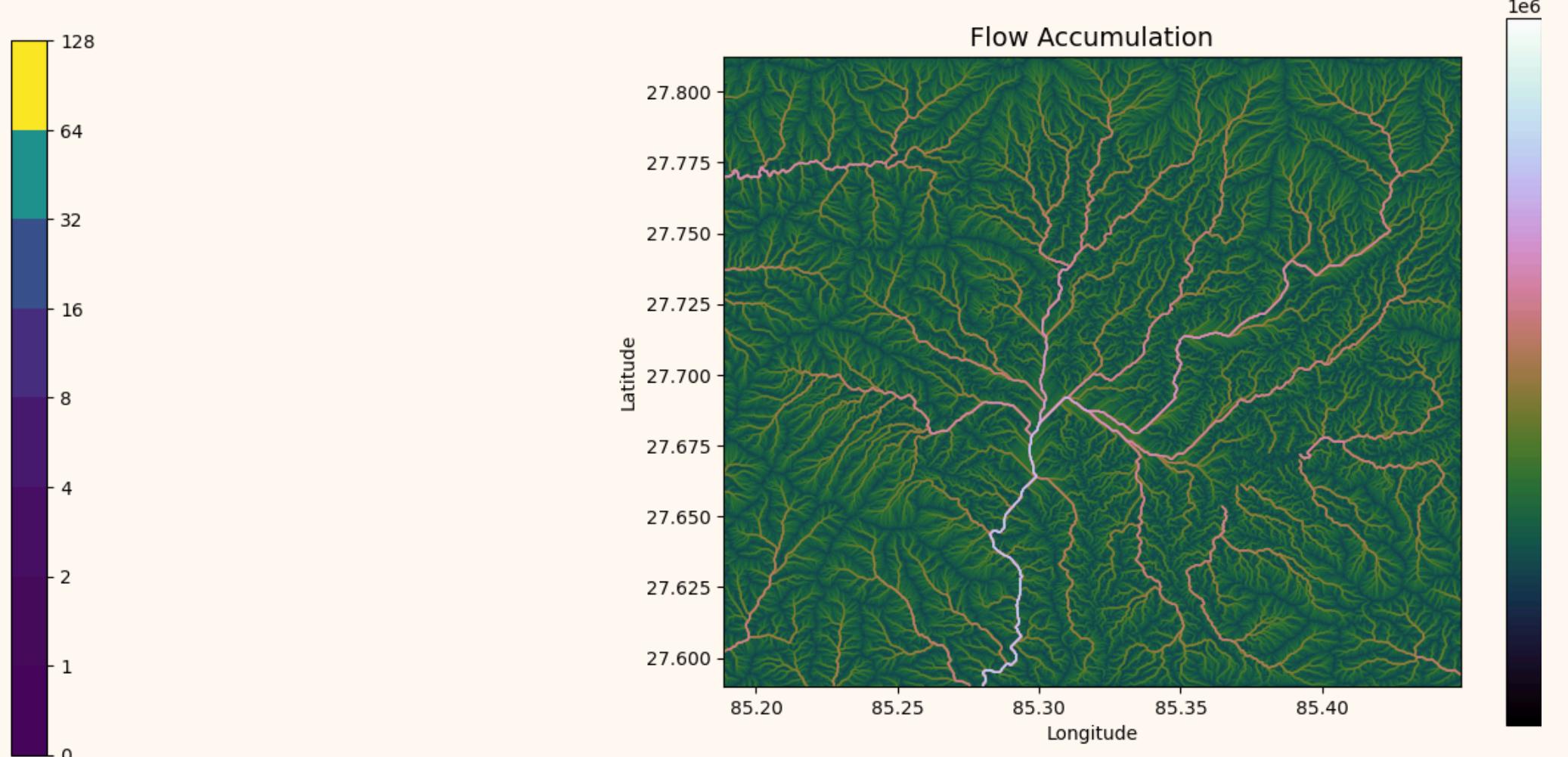
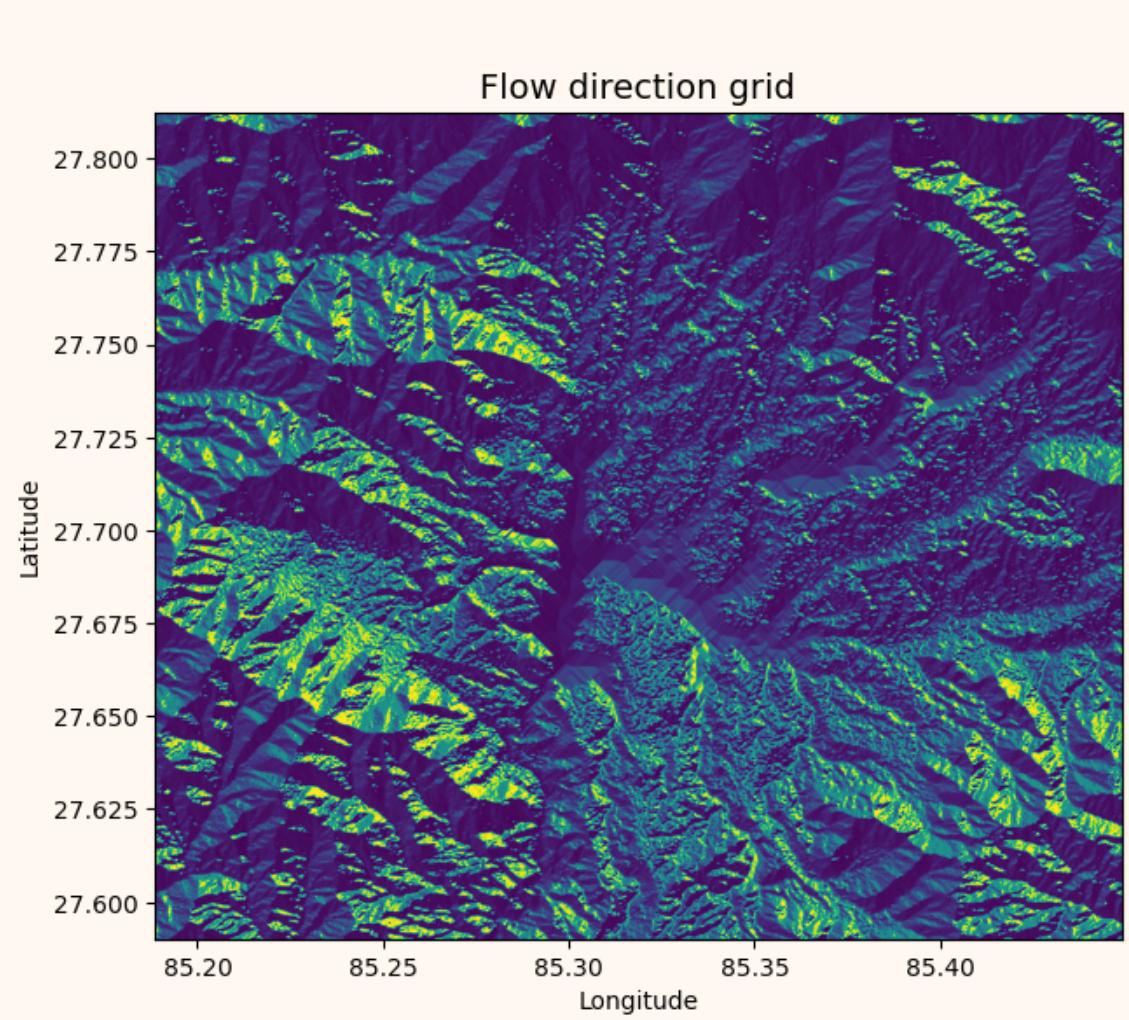
NDVI

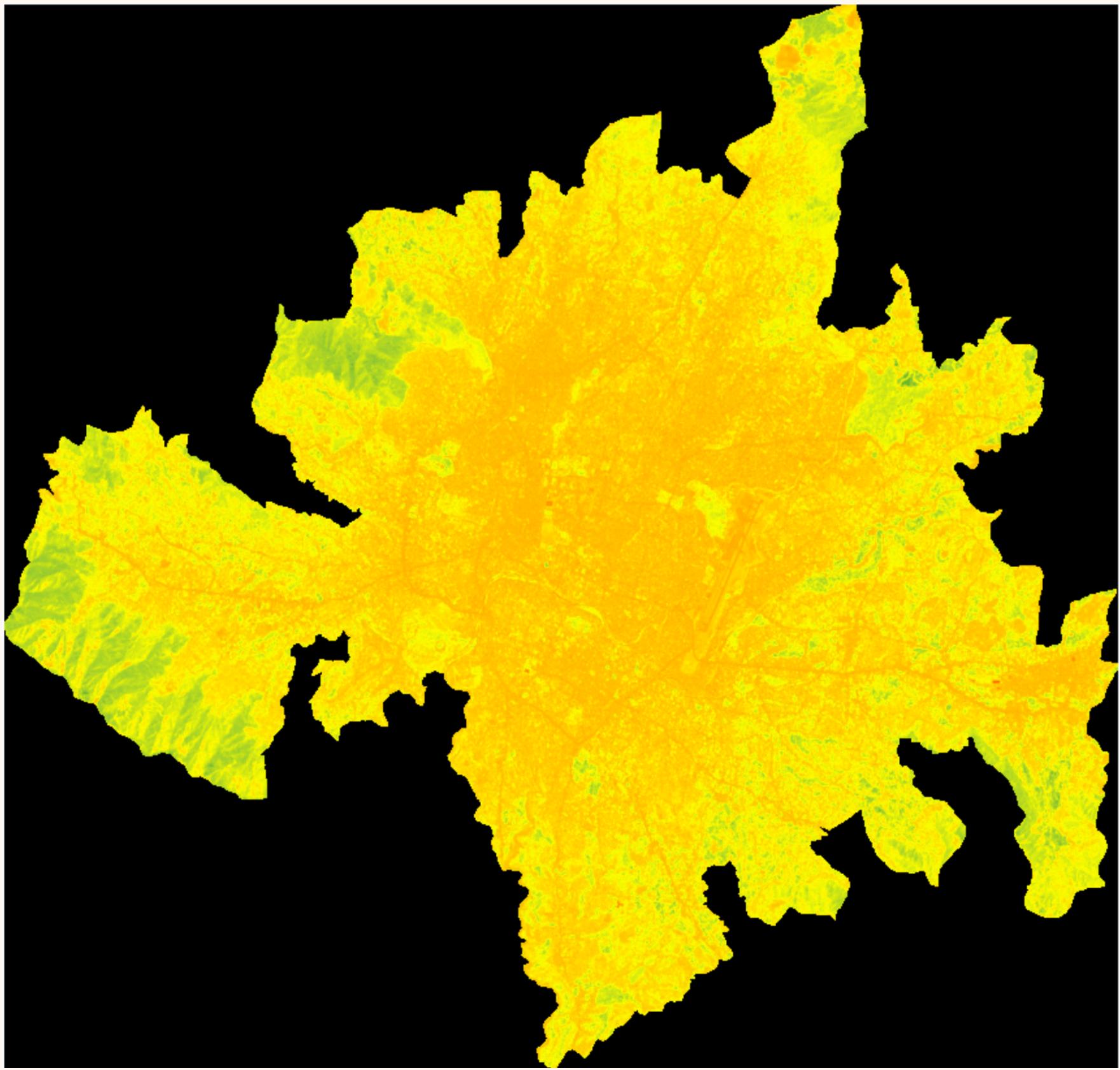
Google Earth Engine NDVI
Calculation



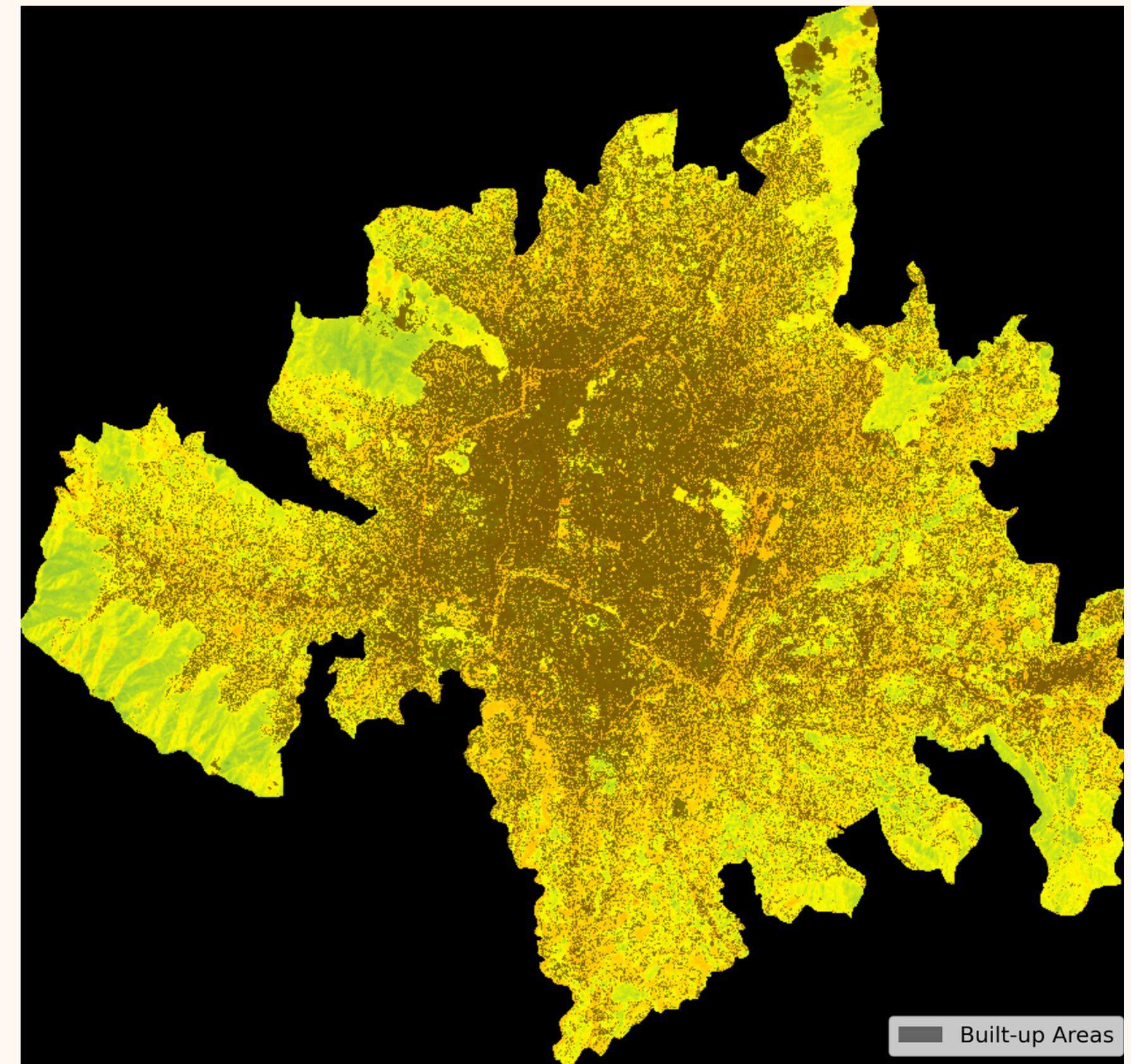
Ward-Level Household Wealth

Nepal 2021 Census





NDVI



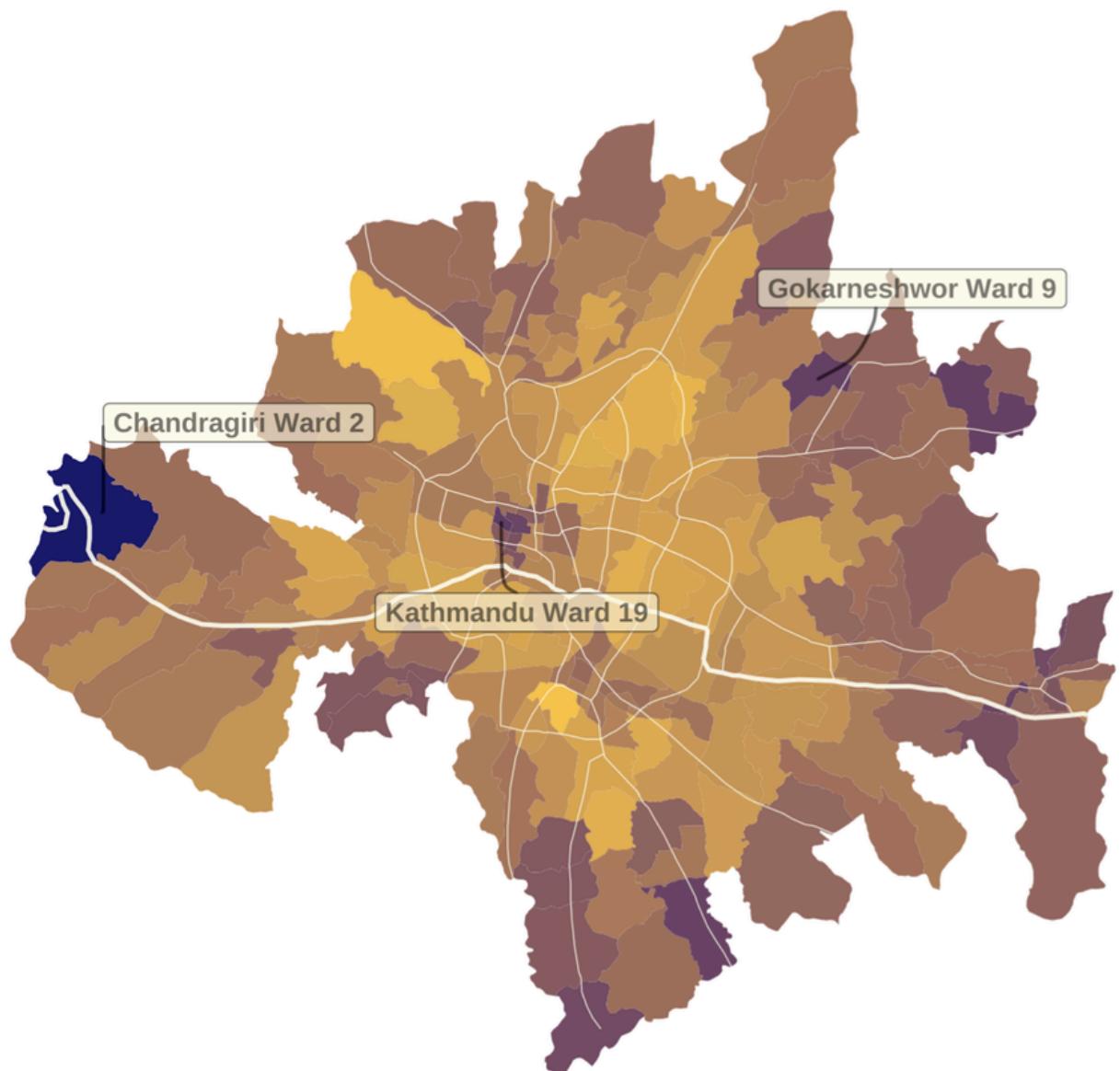
Building Density

Built-up Areas

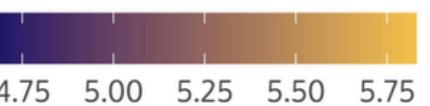
Income

Poorest 3 Wards

Annual income of households in Kathmandu's core wards are comparable to households living in its rural outskirts

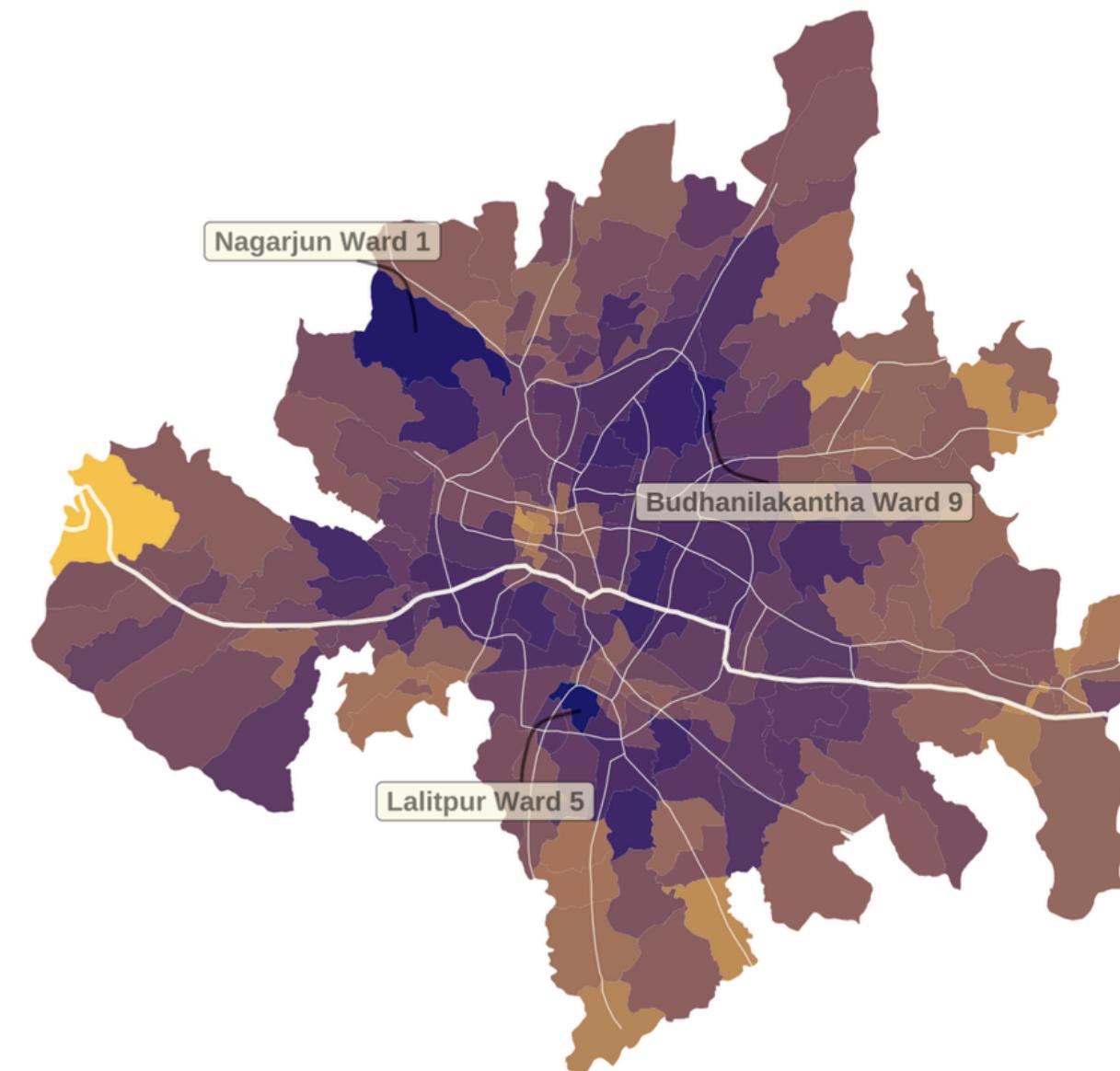


Est Annual Income
in Lakhs

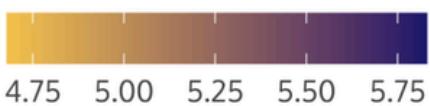


Richest 3 Wards

Lalitpur's Ekantakuna, Nagarjun's Raniban, and Budhanilkantha's Mandikatar have the highest concentration of high income households



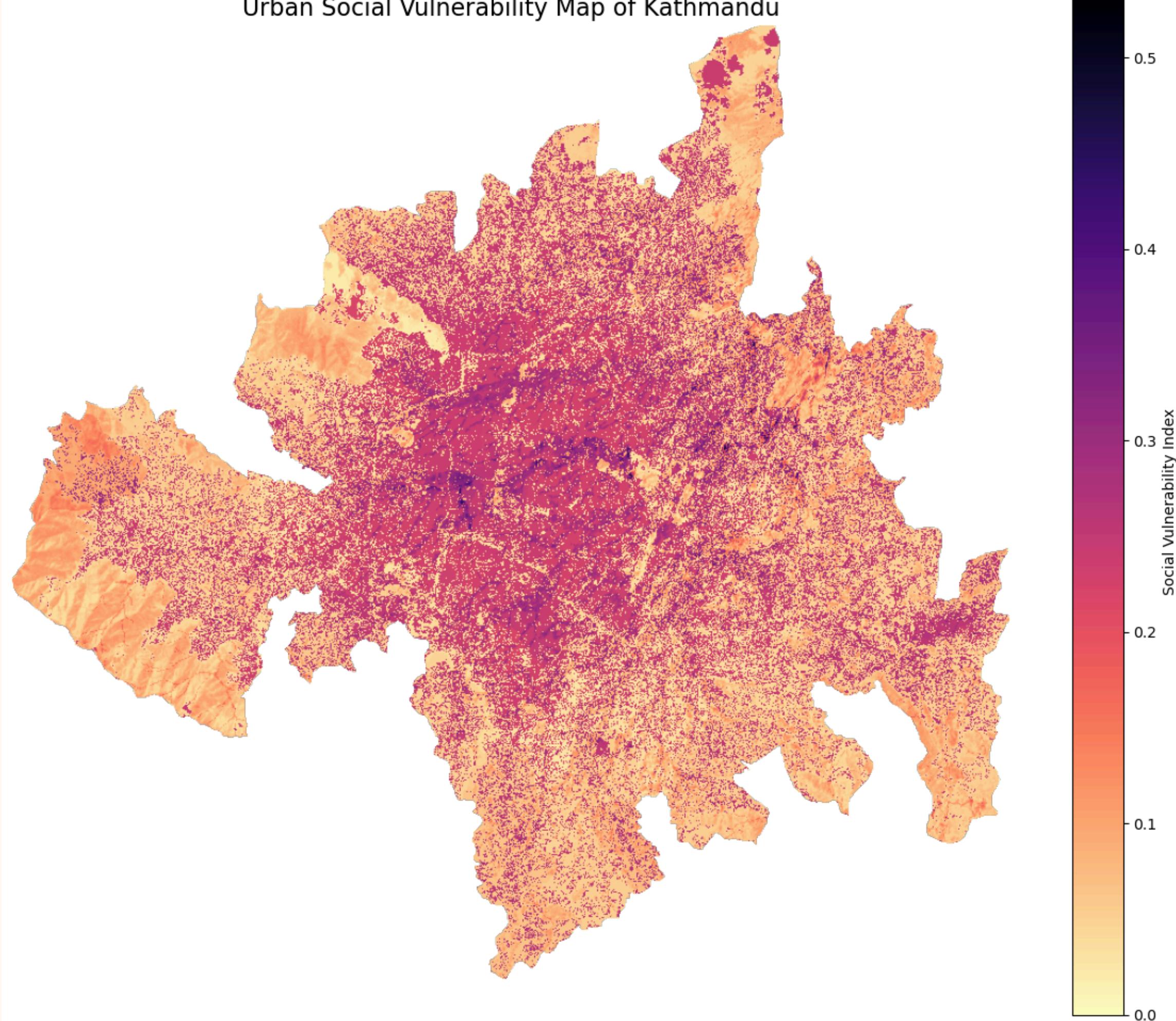
Est Annual Income
in Lakhs



Data Source: Nepal 2021 Census

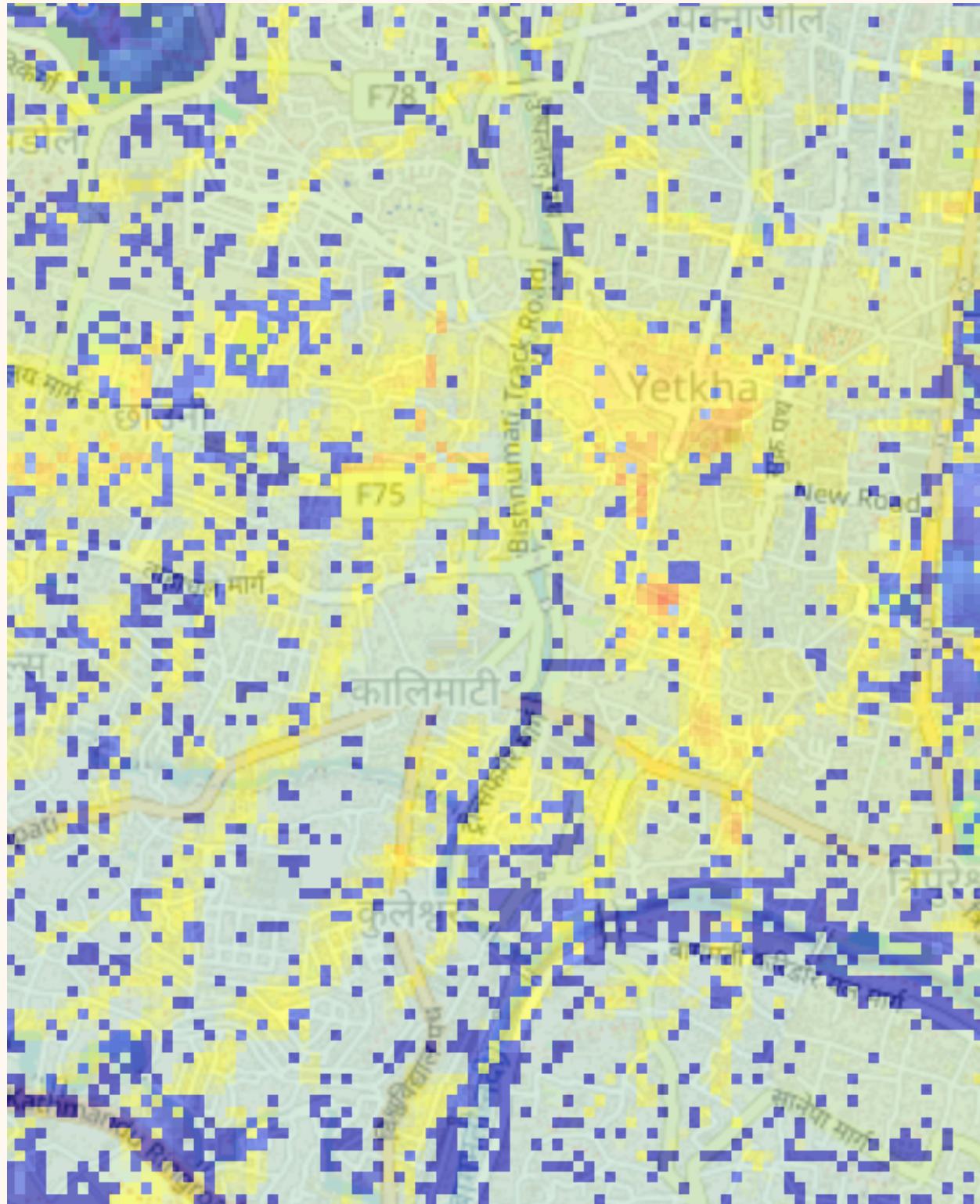
Data Source: Nepal 2021 Census

Urban Social Vulnerability Map of Kathmandu



GROUND TRUTHING

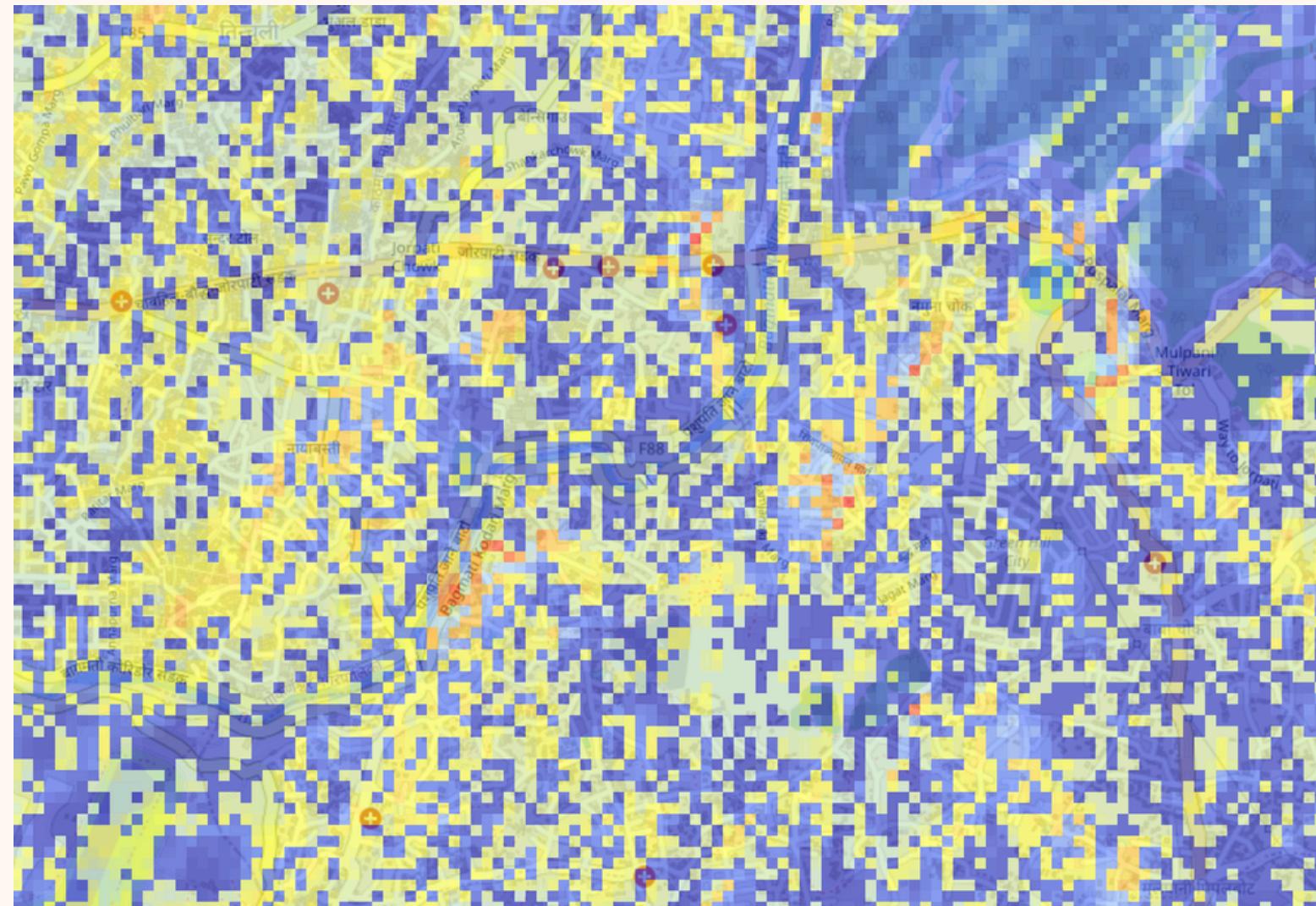
Vulnerability Cluster #1: Yethka



Historic District with No
Greenery, Old Buildings

GROUND TRUTHING

Vulnerability Cluster #2: Jorpati



Housing built on “reclaimed”
seasonal rivers, newly
urbanising suburbs